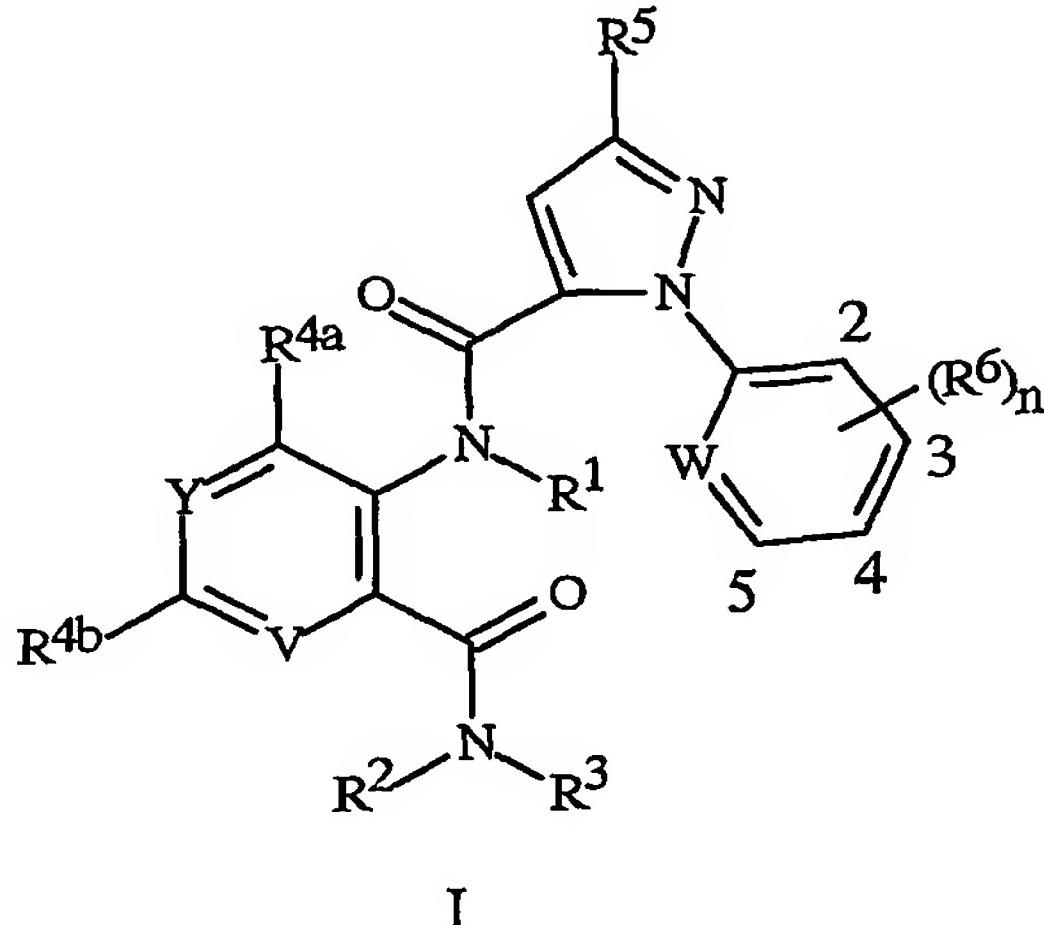


CLAIMS

What is claimed is:

1. A compound of Formula I, its *N*-oxide or an agronomic or nonagronomic suitable salt thereof



wherein:

Y and V are each independently N or CR^{4a};

W is N, CH or CR⁶;

10 R¹ is H; or C₁-C₆ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl or C₃-C₆ cycloalkyl, each optionally substituted with 1 to 5 substituents independently selected from the group consisting of halogen, CN, NO₂, hydroxy, C₁-C₄ alkoxy, C₁-C₄ alkylthio, C₁-C₄ alkylsulfinyl, C₁-C₄ alkylsulfonyl, C₂-C₄ alkoxy carbonyl, C₁-C₄ alkylamino, C₂-C₈ dialkylamino and C₃-C₆ cycloalkylamino; or

15 R¹ is C₂-C₆ alkylcarbonyl, C₂-C₆ alkoxy carbonyl, C₂-C₆ alkylaminocarbonyl or C₃-C₈ dialkylaminocarbonyl;

R² is H, C₁-C₆ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₆ cycloalkyl, C₁-C₄ alkoxy, C₁-C₄ alkylamino, C₂-C₈ dialkylamino, C₃-C₆ cycloalkylamino, C₂-C₆ alkoxy carbonyl or C₂-C₆ alkylcarbonyl;

20 R³ is H; G; C₁-C₆ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl or C₃-C₆ cycloalkyl, each optionally substituted with 1 to 5 substituents independently selected from the group consisting of halogen, G, CN, NO₂, hydroxy, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₄ alkylthio, C₁-C₄ alkylsulfinyl, C₁-C₄ alkylsulfonyl, C₂-C₆ alkoxy carbonyl, C₂-C₆ alkylcarbonyl, C₃-C₆ trialkylsilyl, phenyl, phenoxy and

25 5- or 6-membered heteroaromatic ring, each phenyl, phenoxy and 5- or 6-membered heteroaromatic ring optionally substituted with 1 to 3 substituents independently selected from R¹⁴; C₁-C₄ alkoxy; C₁-C₄ alkylamino; C₂-C₈ dialkylamino; C₃-C₆ cycloalkylamino; C₂-C₆ alkoxy carbonyl; C₂-C₆

alkylcarbonyl; or phenyl optionally substituted with 1 to 3 substituents independently selected from R¹⁴; or

5 R² and R³ are taken together with the nitrogen to which they are attached to form a ring containing 2 to 6 atoms of carbon and optionally one additional atom of nitrogen, sulfur and oxygen, said ring optionally substituted with 1 to 4 substituents independently selected from the group consisting of C₁-C₂ alkyl, halogen, CN, NO₂ and C₁-C₂ alkoxy;

10 G is a 5- or 6-membered nonaromatic carbocyclic or heterocyclic ring, optionally including one or two ring members independently selected from the group consisting of C(=O), S(O) or S(O)₂ and optionally substituted with 1 to 4 substituents independently selected from the group consisting of C₁-C₂ alkyl, halogen, CN, NO₂ and C₁-C₂ alkoxy;

15 R^{4a} and R^{4b} are each independently H, C₁-C₆ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₆ cycloalkyl, C₁-C₆ haloalkyl, C₂-C₆ haloalkenyl, C₂-C₆ haloalkynyl, C₃-C₆ halocycloalkyl, halogen, CN, SCN, NO₂, hydroxy, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₄ alkylthio, C₁-C₄ alkylsulfinyl, C₁-C₄ alkylsulfonyl, C₁-C₄ alkylsulfonyloxy, C₁-C₄ haloalkylthio, C₁-C₄ haloalkylsulfinyl, C₁-C₄ haloalkylsulfonyl, C₁-C₄ haloalkylsulfonyloxy, C₁-C₄ alkylamino, C₂-C₈ dialkylamino, C₃-C₆ cycloalkylamino, C₂-C₆ alkylcarbonyl, C₂-C₆ alcoxycarbonyl, C₂-C₆ alkylaminocarbonyl, C₃-C₈ dialkylaminocarbonyl or C₃-C₆ trialkylsilyl; or

20 R^{4a} and R^{4b} are each independently phenyl, benzyl or phenoxy, each optionally substituted with 1 to 3 substituents independently selected from R¹⁴;

25 R⁵ is C₁-C₆ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₆ cycloalkyl, C₄-C₇ alkylcycloalkyl, C₁-C₆ haloalkyl, C₂-C₆ haloalkenyl, C₂-C₆ haloalkynyl, C₃-C₆ halocycloalkyl, C₄-C₇ haloalkylcycloalkyl, each substituted with 1 to 2 substituents independently selected from R¹¹; or

30 R⁵ is OR⁷, S(O)_pR⁷, NR⁸R⁹, OS(O)₂R¹⁰, NR⁹S(O)₂R¹⁰, C(S)NH₂, C(R¹³)=NOR¹³, C₄-C₇ halocycloalkylalkyl, C₁-C₄ alkylaminothiocarbonyl or C₁-C₄ dialkylaminothiocarbonyl;

35 each R⁶ is independently C₁-C₆ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₆ cycloalkyl, C₁-C₆ haloalkyl, C₂-C₆ haloalkenyl, C₂-C₆ haloalkynyl, C₃-C₆ halocycloalkyl, halogen, CN, CO₂H, C(O)NH₂, NO₂, hydroxy, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₄ alkylthio, C₁-C₄ alkylsulfinyl, C₁-C₄ alkylsulfonyl, C₁-C₄ haloalkylthio, C₁-C₄ haloalkylsulfinyl, C₁-C₄ haloalkylsulfonyl, C₁-C₄ alkylamino, C₂-C₈ dialkylamino, C₃-C₆ cycloalkylamino, C₂-C₆ alkylcarbonyl, C₂-C₆ alcoxycarbonyl, C₂-C₆ alkylaminocarbonyl, C₃-C₈ dialkylaminocarbonyl, C₃-C₆ trialkylsilyl; or

each R⁶ is independently a phenyl, benzyl, benzoyl, phenoxy, 5- or 6-membered heteroaromatic ring or an aromatic 8-, 9- or 10-membered fused heterobicyclic ring system, each ring optionally substituted with 1 to 3 substituents independently selected from R¹⁴;

5 each R⁷ is independently C₁-C₆ alkyl substituted with R¹²; C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₆ cycloalkyl, C₄-C₇ cycloalkylalkyl, C₄-C₇ alkylcycloalkyl, C₂-C₆ haloalkenyl, C₂-C₆ haloalkynyl, C₃-C₆ halocycloalkyl, C₄-C₇ haloalkylcycloalkyl, C₄-C₇ halocycloalkylalkyl or C₂-C₆ haloalkylcarbonyl, each optionally substituted with one R¹²;

10 R⁸ is C₁-C₆ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₆ cycloalkyl, C₄-C₇ alkylcycloalkyl, C₁-C₆ haloalkyl, C₂-C₆ haloalkenyl, C₂-C₆ haloalkynyl, C₃-C₆ halocycloalkyl, C₄-C₇ haloalkylcycloalkyl or C₂-C₆ haloalkylcarbonyl, each substituted with one R¹²;

15 R⁹ is H; or C₁-C₆ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₆ cycloalkyl, C₄-C₇ alkylcycloalkyl, C₁-C₆ haloalkyl, C₂-C₆ haloalkenyl, C₂-C₆ haloalkynyl, C₃-C₆ halocycloalkyl or C₄-C₇ haloalkylcycloalkyl, each optionally substituted with one R¹²;

20 R¹⁰ is C₁-C₆ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, C₃-C₆ cycloalkyl, C₄-C₇ alkylcycloalkyl, C₁-C₆ haloalkyl, C₂-C₆ haloalkenyl, C₂-C₆ haloalkynyl, C₃-C₆ halocycloalkyl or C₄-C₇ haloalkylcycloalkyl, each optionally substituted with one R¹²;

each R¹¹ is independently C₁-C₆ alkoxy, C₁-C₆ haloalkoxy, C₁-C₆ alkylthio, C₁-C₆ haloalkylthio, C₁-C₆ alkylsulfinyl, C₁-C₆ haloalkylsulfinyl, C₁-C₆ alkylsulfonyl, C₁-C₆ haloalkylsulfonyl, CN or C₂-C₄ alkoxy carbonyl;

25 each R¹² is independently C₁-C₆ alkoxy, C₁-C₆ haloalkoxy, C₁-C₆ alkylthio, C₁-C₆ haloalkylthio, C₁-C₆ alkylsulfinyl, C₁-C₆ haloalkylsulfinyl, C₁-C₆ alkylsulfonyl, C₁-C₆ haloalkylsulfonyl, CN, NO₂, C₂-C₄ alkoxy carbonyl, C₁-C₆ alkylamino or C₂-C₆ dialkylamino; or

30 each R¹² is independently a phenyl or a 5- or 6-membered heteroaromatic ring, each ring optionally substituted with 1 to 3 substituents independently selected from R¹⁴;

each R¹³ is independently H, C₁-C₄ alkyl, or C₁-C₄ haloalkyl;

35 each R¹⁴ is independently C₁-C₄ alkyl, C₂-C₄ alkenyl, C₂-C₄ alkynyl, C₃-C₆ cycloalkyl, C₁-C₄ haloalkyl, C₂-C₄ haloalkenyl, C₂-C₄ haloalkynyl, C₃-C₆ halocycloalkyl, halogen, CN, NO₂, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₄ alkylthio, C₁-C₄ alkylsulfinyl, C₁-C₄ alkylsulfonyl, C₁-C₄ alkylamino, C₂-C₈ dialkylamino, C₃-C₆ cycloalkylamino, C₃-C₆ (alkyl)cycloalkylamino, C₂-C₄

alkylcarbonyl, C₂-C₆ alkoxycarbonyl, C₂-C₆ alkylaminocarbonyl, C₃-C₈ dialkylaminocarbonyl or C₃-C₆ trialkylsilyl;

n is 0, 1, 2, 3 or 4; and

p is 0, 1 or 2.

2. The compound of Claim 1 wherein

R¹ is H, C₁-C₄ alkyl, C₂-C₄ alkenyl, C₂-C₄ alkynyl, C₃-C₆ cycloalkyl, C₂-C₆ alkylcarbonyl or C₂-C₆ alkoxycarbonyl;

R² is H, C₁-C₄ alkyl, C₂-C₄ alkenyl, C₂-C₄ alkynyl, C₃-C₆ cycloalkyl, C₂-C₆ alkylcarbonyl or C₂-C₆ alkoxycarbonyl;

10 R³ is C₁-C₆ alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl or C₃-C₆ cycloalkyl each optionally substituted with 1 to 5 substituents independently selected from the group consisting of halogen, CN, C₁-C₂ alkoxy, C₁-C₂ alkylthio, C₁-C₂ alkylsulfinyl and C₁-C₂ alkylsulfonyl;

15 R^{4a} and R^{4b} are each independently H, C₁-C₄ alkyl, C₁-C₄ haloalkyl, halogen, CN, NO₂, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₄ alkylthio, C₁-C₄ alkylsulfinyl, C₁-C₄ alkylsulfonyl, C₁-C₄ haloalkylthio, C₁-C₄ haloalkylsulfinyl or C₁-C₄ haloalkylsulfonyl;

each R⁶ is independently C₁-C₄ alkyl, C₁-C₄ haloalkyl, halogen, CN, NO₂, C₁-C₄ alkoxy, C₁-C₄ haloalkoxy, C₁-C₄ alkylthio, C₁-C₄ alkylsulfinyl, C₁-C₄ alkylsulfonyl, C₁-C₄ haloalkylthio, C₁-C₄ haloalkylsulfinyl, C₁-C₄ haloalkylsulfonyl or C₂-C₄ alkoxycarbonyl; and

n is 0, 1 or 2.

3. The compound of Claim 2 wherein:

Y and V are each independently N or CH;

25 W is N, CH, CF, CCl, CBr or Cl;

R¹ is H;

R² is H or CH₃;

R³ is C₁-C₄ alkyl optionally substituted with 1 to 5 substituents independently selected from the group consisting of halogen, CN, OCH₃ and S(O)_pCH₃;

30 R^{4a} and R^{4b} are each independently H, CH₃, CF₃, OCF₃, OCHF₂, S(O)_pCF₃, S(O)_pCHF₂, S(O)_pCHF₂, CN or halogen;

each R⁶ is independently halogen, CN, CH₃, CF₃, OCHF₂, S(O)_pCF₃, S(O)_pCHF₂, OCH₂CF₃, OCF₂CHF₂, S(O)_pCH₂CF₃ or S(O)_pCF₂CHF₂; and

n is 0 or 1.

35 4. The compounds of Claim 3 wherein

W is N; and

R^{4a} and R^{4b} are each independently H, CH₃, CF₃, CN or halogen.

5. The compound of Claim 4 wherein

R³ is C₁-C₄ alkyl;

R^{4a} is H, CH₃, Cl, Br or I;

R^{4b} is H, F, Cl, Br, I, CN or CF₃;

R⁵ is OS(O)₂CH₃, OS(O)₂CF₃, CF₂O(C₁-C₄ alkyl), CF₂S(C₁-C₄ alkyl) or C₃-C₄ haloalkenyloxy; and

5 R⁶ is CH₃, CF₃, OCH₂CF₃, OCHF₂ or halogen at position 2.

6. The compounds of Claim 4 wherein

R³ is C₁-C₄ alkyl;

R^{4a} is H, CH₃, Cl, Br or I;

10 R^{4b} is H, F, Cl, Br, I, CN or CF₃; and

R⁵ is C₂-C₆ alkenyloxy, C₂-C₆ alkynyoxy, C₁-C₆ alkoxy substituted with CN or C₁-C₂ alkoxy.

7. The compounds of Claim 4 wherein

R³ is C₁-C₄ alkyl;

15 R^{4a} is H, CH₃, Cl, Br or I;

R^{4b} is H, F, Cl, Br, I, CN or CF₃; and

R⁵ is C(R¹³)=NOR¹³.

8. A composition of controlling an invertebrate pest comprising biologically effective amount of a compound of Claim 1 and at least one additional component selected 20 from the group consisting of a surfactant, a solid diluent, and a liquid diluent, said composition optionally further comprising an effective amount of at least one additional biologically active compound or agent.

9. The composition of Claim 8 wherein the additional biologically active compound or agent is present and is selected from the group consisting of cypermethrin, 25 cyhalothrin, cyfluthrin, beta-cyfluthrin, esfenvalerate, fenvalerate, tralomethrin, fenothiocarb, methomyl, oxamyl, thiodicarb, clothianidin, imidacloprid, thiacycloprid, indoxacarb, spinosad, abamectin, avermectin, emamectin, γ -aminobutyric acid, endosulfan, ethiprole, fipronil, flufenoxuron, triflumuron, diofenolan, pyriproxyfen, pymetrozine, amitraz, Bacillus thuringiensis, Bacillus thuringiensis delta endotoxin, a member of the family Baculoviridae, 30 and entomophagous fungi.

10. A method for controlling an invertebrate pest comprising contacting the invertebrate pest or its environment with a biologically effective amount of a compound of Claim 1 or with a biologically effective amount of a composition of Claim 8.

11. The method of Claim 10 wherein the invertebrate pest is cockroach, an ant or 35 a termite which contacts the compound by consuming a bait composition comprising the compound or the composition.

12. The method of Claim 10 wherein the invertebrate pest is a mosquito, a black fly, a stable, fly, a deer fly, a horse fly, a wasp, a yellow jacket, a hornet, a tick, a spider, an

ant, or a gnat which is contacted by a spray composition comprising the compound or the composition dispensed from a spray container.

13. A spray composition, comprising:

- (a) a compound of Claim 1 or a composition of Claim 8; and
- (b) a propellant.

5 14. A bait composition, comprising:

- (a) a compound of Claim 1 or a composition of Claim 8;
- (b) one or more food materials;
- (c) optionally an attractant; and

10 (c) optionally a humectant.

15 15. A device for controlling an invertebrate pest, comprising:

- (a) the bait composition of Claim 14; and
- (b) a housing adapted to receive the bait composition, wherein the housing has at least one opening sized to permit the invertebrate pest to pass through the opening so the invertebrate pest can gain access to the bait composition from a location outside the housing, and wherein the housing is further adapted to be placed in or near a locus of potential or known activity for the invertebrate pest.